Sept. 12, 1967 G. SCHWARTZMAN 3,340,561

APPLICATOR HAVING ONE-PIECE BODY

Filed Feb. 18, 1965

Fig. 1

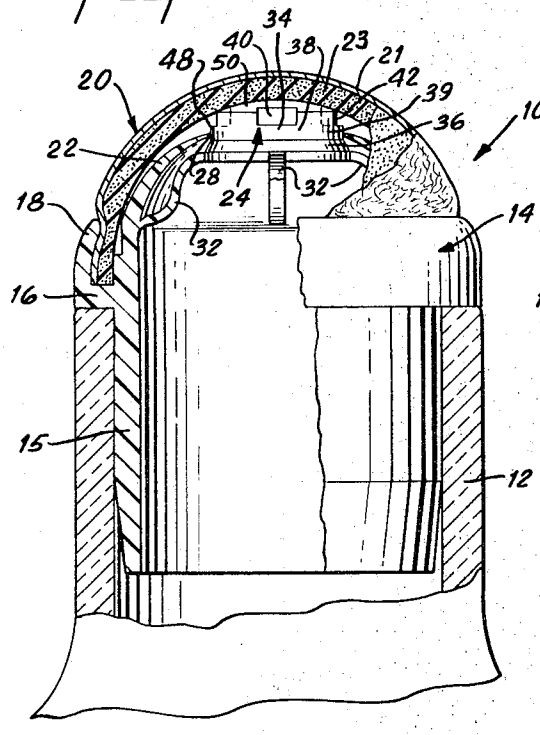


Fig. 2

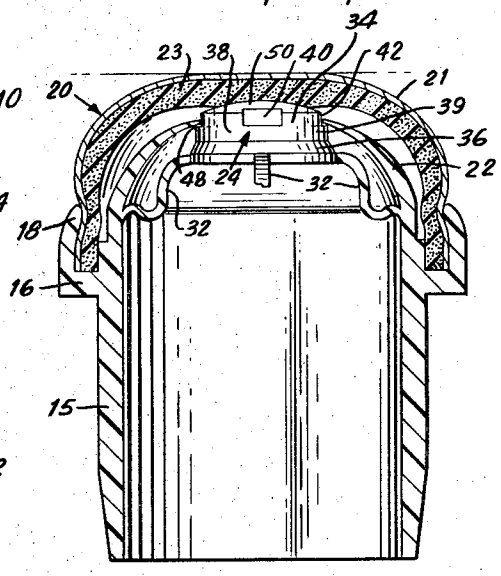


Fig. 3

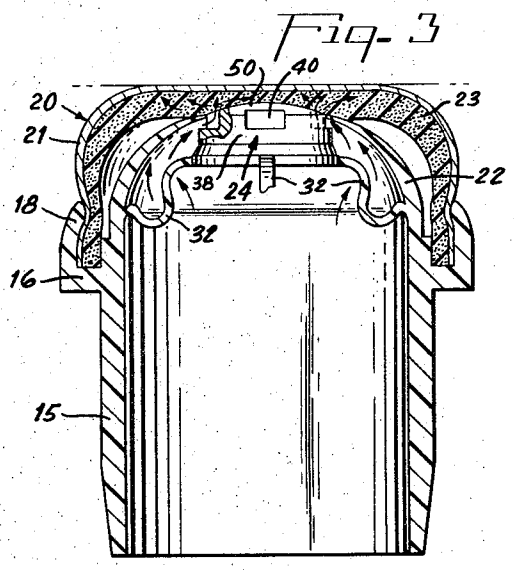
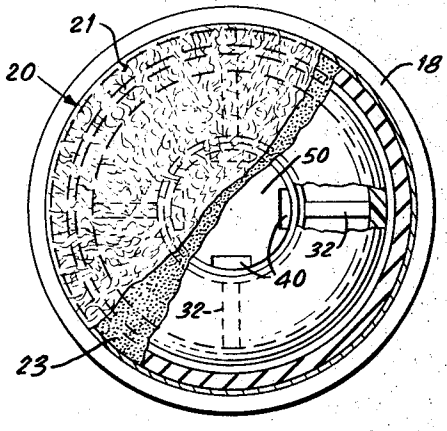


Fig. 4



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APPLICATOR HAVING ONE-PIECE BODY

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ABSTRACT OF THE DISCLOSURE

A fluid applicator comprising a retainer ring which has a projecting portion. The retainer ring is tapered upwardly to form a flexible crown having a reduced thickness having an opening therein forming a valve seat. A valve head which is movable with respect to the valve seat to control fluid flow through the opening and is biased against the valve seat by a plurality of spring filaments. The valve head includes a stepped portion having a relatively enlarged lower part and a relatively smaller upper part that is fluted for allowing fluid flow upon slight depression of the valve head.

This invention relates to a fluid applicator especially adapted for use in applying shoe polish or for applying cosmetics or medications on the shoes, clothing or on the person of the user. This application is copending with the application Ser. No. 271,019, filed Apr. 5, 1963, for "Fluid Applicator."

An object of this invention resides in the provision of of a fluid applicator having a one-piece body for use in facilitating the application of cosmetics, medications, shoe polish or the like.

Another object of this invention resides in the provision in a fluid applicator having a novel one-piece body including valve means integrally formed with the body and which valve means are automatically actuated and adapted to control the flow of shoe polish from the fluid applicator for obtaining an even flow of shoe polish onto a shoe, independent of the contours or shape of the shoe and so that fluid flow may be conveniently had onto the outer surface of the fluid applicator for applying shoe polish into crevices, corners, and other spaces where access is difficult, while assuring complete closing of the valve means when the fluid applicator is not in use.

In the past fluid applicators have been produced which are provided with applicator ends serving to actuate mechanical valves which were constructed separately from the body. These prior art valve members normally added considerable expense to the manufacture of the fluid applicators since separate molding steps for making these devices of plastic material were entailed. An assembly step was also necessitated. The present invention employs the concept of a one-piece body having valve means integrally formed therewith which requires only a single molding operation to produce and eliminates the necessity for the assembly step. In accomplishing these advantages, further and unexpected results are obtained in that a more positive acting valve of lighter weight is achieved, less material is required, and the spring actuating mechanism is more efficient.

A further important feature of this invention resides in an arrangement of a one-piece body having a spherical tapered dauber crown provided with an opening forming a valve seat and with present-day molding capabilities, a valve assembly having portions of even greater diameter than the opening can be made integrally with the body and connected thereto by spring filaments.

A further object of the invention resides in the provision of an integrally formed valve head, body including a dauber crown, a valve body, valve spring and seating ring for use in a fluid applicator, all formed together in

one molding operation from a synthetic plastic material such as polyurethane or polyethylene.

An additional object of the invention resides in the provision of a valve assembly for a fluid applicator that is provided with a novel dauber crown that is tapered for better application of fluid, yet which will prevent spillage or leakage.

Still further objects and features of this invention reside in the provision of a fluid applicator having a one-piece body which is especially inexpensive to manufacture, simple to use, capable of metering fluid of various viscosities in an effective manner so that the fluid applicator is especially adapted for use in applying shoe polish, medications, cosmetics, oils, polishes and the like, and which fluid applicator may be made in any convenient size as desired.

These, together with the various ancillary objects and features of the invention, which will become apparent as the following description proceeds, are attained by this fluid applicator, a preferred embodiment of which is illustrated in the accompanying drawings, by way of example only, wherein:

FIG. 1 is a vertical sectional detail view of an assembled fluid applicator constructed in accordance with the concepts of the present invention illustrating the fluid applicator in an initial sealed position;

FIG. 2 is a vertical sectional view similar to FIG. 1, but illustrating the fluid applicator in a closed position after use;

FIG. 3 is a vertical sectional view similar to FIG. 1, but illustrating the fluid applicator in a position during use with the valve open; and,

FIG. 4 is a top plan view with parts of the fluid applicator being broken away showing other parts in section and in detail.

With continuing reference to the accompanying drawings wherein like reference numerals designate similar parts throughout the various views, reference numeral **10** is used to generally designate the fluid applicator comprising the present invention. This fluid applicator includes a container **12** having a neck in which a projecting portion **15** of a retaining ring **14** is positioned. The retaining ring includes a flange **16** provided with an upwardly swaged lip **18** for retaining a cover **20** in position between the lip **18** and a dauber crown **22** of substantially hemispherical configuration.

The cover **20** is constructed of two disc-shaped layers, the upper layer **21** of which is formed of a nylon knitted brushed fabric so as to achieve a felt-like applicator surface and appearance, while having the chemical inertness and strength of the nylon. Laminated and bonded to the nylon knitted brushed fabric is the lower layer **23** of coarse polyurethane foam.

The crown **22** is tapered so as to be relatively thin and fairly flexible at its uppermost portion defining the circular opening **28** therein. Cooperating with the arcuate tapered opening **28**, which serves as a valve seat, is the integrally molded valve assembly, generally indicated at **24**. The valve assembly **24** includes four spring filaments **32**, the lower portion being integrally joined to the crown **22**. The spring filaments **32** continuously urge the valve assembly **24** upwardly and into engagement with the peripheral edges of the crown **22** defining the opening **28**. The spring filaments **32** are undercut from the crown and are relatively resilient.

The valve assembly **24** includes a valve head **34** having a truncated conical base portion **36** to which a stepped portion **38** is integrally attached. The stepped portion is also provided with a series of four fluted portions **40**, assuring flow of fluid.

It is to be noted that the diameters of the truncated base portion **36** and of the lower part **39** of the stepped

portion **38** are greater than the diameter of the opening **28**, which arrangement is achieved in a single molding operation using novel molding process whereby such undercuts including the spring filaments **32** are possible to obtain. In the alternative, using a more conventional method of forming the crown **22** so that the opening **28** is of smaller diameter than the basic portions of the valve assembly **24**, it is possible to mold the crown **22** with the opening **28** slightly larger than the valve assembly and then swage it until it has a smaller diameter. However, this later process requires an additional step in the production, and is not as desirable as the single molding operation. The diameter of the upper part **42** of the stepped portion **38** is of slightly smaller diameter than the opening **28**.

The spring filaments **32** are just long enough so that when they are extended as much as possible, such as shown in FIG. 3, the valve assembly **24** is still within the confines of the crown **22** and not disengaged therefrom.

In initial assembly of the device after molding, and while the molded one-piece body is still warm after removal thereof from the mold, the valve assembly **24** is pushed from the inside until the lower part of the stepped portion **38** is resiliently held in a fluid-tight seal by the tapered peripheral edge of the crown defining the opening **28**. This will, upon cooling of the one-piece body, cause the spring filaments **32** to take as a set, so as to always have a tendency to run to this position. Thereafter, the cover **20** is swaged in place. Upon use, and as shown in FIG. 3, the valve assembly is pushed downwardly allowing fluid to flow between the valve assembly **24** and the crown **22** through the opening **28** and into the cover as shown by the arrows in FIG. 3. Of course, the fluting **40** assures and guarantees proper fluid flow. Upon removal of the fluid applicator from the surface on which fluid is to be dispensed, the spring filament will urge the valve assembly **24** upwardly so that the peripheral edge **48** of the lower step **39** will form a fluid seal with the undersurface of the crown, and thus close the dauber. The valve assembly has an upper convex surface **50**.

The tapered shape of the crown **22** not only allows for the desired undercuts so as to achieve the one-piece product, but an unexpected result is obtained in that the tapered configuration of the crown allows for a highly desirable effect of increased flexibility of the fluid applicator and the capability of penetrating various interstices during application of fluid.

A latitude of modification, substitution and change is intended in the foregoing disclosure, and in some instances, some features of the invention will be employed without a corresponding use of other features. Accordingly, it is appropriate that the appended claim be construed broadly and in a manner consistent with the spirit and scope of the present invention.

I claim:

A fluid applicator comprising a retainer ring having a projecting portion, said retaining ring being tapered upwardly to form a flexible crown having a reduced thickness, said crown having an opening therein forming a valve seat, a valve head movable with respect to said valve seat to control fluid flow through said opening, a plurality of resilient spring filaments integrally formed with and undercut from said valve head and to said crown at a location spaced considerably below said opening and set to normally urge said valve head into said opening and against said crown, said valve head including a stepped portion including a relatively larger lower part and a relatively smaller upper part, said lower part being of larger diameter than said opening with said crown initially clampingly engaging said lower part and so that upon initial depression of said valve head, said lower part passes through said opening, the force exerted by said spring filaments being insufficient to thereafter force said lower part through said opening so that the upper outer peripheral edge of said lower part engages said crown for closing said fluid applicator, said upper part being fluted for allowing fluid flow upon slight depression thereafter of said valve head.

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